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ABSTRACT

A study investigated the effects of instructional materials for goal-setting on students' goal-analysis skill, goal-setting habits, and self-efficacy for self-regulated learning (SESRL). Subjects were 75 junior and senior college students in a required health science course, randomly assigned to use either one of two sets of self-instructional materials: (1) goal-setting studies or (2) case studies in health science. Both groups were pre- and posttested on SESRL and goal-setting, and posttested on goal analysis skill. Instruction for each group lasted 4 weeks. Posttest results indicated that goal-setting instruction was efficient and effective in teaching basic concepts about the nature and purposes of goals, types of goals, and the qualities of effective goals. The treatment group outperformed the control group on the goal-analysis posttest. Instruction did not affect goal-setting habits significantly; several possible explanations are offered. However, the group receiving goal-setting instruction scored significantly lower than the control group on the SESRL measure, an unanticipated finding, suggesting the need for further research. (Contains 23 references.) (MSE)

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The Effects of Goal-setting Instruction on Self-efficacy for Self-regulated Learning (SESRL) in Undergraduate Classrooms

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Introduction

According to self-regulation theory, goal-setting, self-regulation, and self-efficacy are the key components to understanding and explaining the behavior and thoughts of successful learners (Bandura, 1986; Zimmerman, 1989; Schunk, 1990). In this paradigm, self-efficacy beliefs and self-regulatory processes work together in an interdependent manner and are mediated by goals (Bandura, 1986). The two key functions of goals, according to Bandura (1986, 1993) are (1) to guide learner efforts to monitor and regulate one's efforts in a particular direction, and (2) to serve as the basis for evaluating one's performance and intensifying effort or revising the original goals. According to Schunk (1994), effective self-regulation requires the evaluation of progress toward goals during task engagement (p. 89). In addition, achieving one's goals can enhance an individual's self-efficacy, i.e., the belief that one can master particular situations or tasks that include ambiguous or novel elements (Bandura, 1995).

Prior studies on the relationships between these constructs typically have defined goals as performance standards, such as number of problems to be solved (Bandura & Schunk, 1981), employee productivity standards (Bandura & Wood, 1989) and expected course grades (Zimmerman, Bandura, & Martinez-Pons, 1992). Further, studies often manipulated some aspect of an instructional or decision-making situation and measured self-efficacy before and after the manipulation (Bandura & Schunk, 1981; Bandura & Wood, 1989).

Although prior studies have tested the effects of providing students with specific goals (e.g., Graham, MacArthur, & Schwartz, 1995; Locke & Bryan, 1966; Locke, Frederick, Lee, & Bobko, 1984; Schunk, 1983a), systematic instruction for goal setting has rarely been implemented. In one study, students in the goal-setting condition received a brief handout on setting specific goals (Ridley, Schutz, Glanz, & Weinstein, 1992). The students then set a task goal for a series of computer-based medical decision-making problems. Results indicated an interaction effect on achievement for goal setting and high metacognitive awareness. The interaction suggests that the instruction may have been adequate for students with high metacognitive awareness, but not for students with low metacognitive awareness. The present researchers speculate that more thorough instruction would be required to teach students how to set effective goals.

In a prior study, the present researchers developed self-instructional materials on goal setting that they implemented with graduate students in education (Gredler, Schwartz, & Davis, 1996). Results indicated a significant effect on students' goal-analysis skill. However, students had difficulty in differentiating long-term and short-term goals and also tended to develop performance-oriented (rather than learning-oriented) goals. The purpose of the present study was to assess the effects of revised instructional materials for goal setting on students' goal-analysis skill, goal-setting habits, and self-efficacy for self-regulated learning (SESRL).

Methods and Procedures

Sample

The sample for the present study consisted of upper-class undergraduates in a required health science course in a major southeastern university. Ninety-one undergraduate students in two sections of the senior-level course participated voluntarily

in the study. All students in the sample were juniors or seniors. The mean GPA was 3.09 with a range of 2.12 to 4.00 on a 4-point scale (4.00=A).

Students who did not complete both the pre and posttest as well as the four instructional units were dropped from the study. Sixteen students (8 from each condition) were dropped for this reason, which left a sample size of 75 students. Eleven of the students were male and 64 were female. The university review board required "age" and "major" to be deleted from the data collection instruments; therefore, this information was not obtained.

Design

Students were randomly assigned to one of two conditions: goal-setting instruction or case studies in health science. Two tailed t-tests on the pretest for self-efficacy for self-regulated learning (SESRL), goal-setting habits, GPA, expected health science grade, and weekly work hours indicated no significant differences between the two groups. Both groups were pre- and post-tested on SESRL and goal-setting habits. The two groups also were post-tested on goal-analysis skill.

Treatment

Two sets of self-instructional materials (goal setting; health science case studies) were developed for the study. The goal-setting instruction was modified from a prior study by Gredler, Schwartz, & Davis (1996). Changes included contextualizing the instruction by introducing two fictional university students, Ryan and Allison; defining essential goal properties; distinguishing between performance and mastery goals; discussing long-term versus sub-goals; and advocating setting goals that are personally valuable. The reader follows Ryan's progress as he learns how to set effective goals from Allison. She has taken a course in which goal setting was taught so she shares the information she learned with Ryan. The control group read health science case studies that were adapted from McWilliams & Bailey (1993). All four case studies involve the same child, Adam, and the difficulties that he, his family, and his health-care case worker encounter.

The instruction for both groups consisted of four packets of information. Each packet concluded with two adjunct questions. Adjunct questions for the goal-setting condition included items (1) to assess comprehension of the instruction and (2) to elicit personal goals. Questions for the health science case study condition focused on (1) comprehension of the instruction and (2) development of recommendations for future action. The first researcher provided brief written feedback on the students' answers. The question page and feedback were returned to the students by the instructor prior to the administration of the next packet.

Prior to the study, the instructor and students were informed that the research purpose was to assess the effectiveness of instructional materials. The instruction was delivered in class weekly over a 4-week period by the course instructor. Each unit of instruction required approximately 15 minutes. Each set of materials was packaged in a sealed, legal-size envelope labeled with the student's last name and social security number. The packets were collected immediately after the students finished and delivered to the first author who prepared the brief feedback responses to the adjunct questions. Students were not allowed to keep the instructional packets in order to minimize the possibility of information exchange between the two conditions.

Instrumentation

The three instruments used in the study assessed self-efficacy for self-regulated learning (SESRL), goal-analysis skill, and goal-setting habits.

SESRL. Students' perceptions of how well they can execute self-regulatory strategies is an important component of self-efficacy for self-regulated learning. However, the capability to execute self-regulatory actions is insufficient if students cannot get themselves to apply them when faced with difficulties, stressors, or competing attractions (Bandura, 1995, p.18). Therefore, an important component of self-efficacy for self-regulated learning is students' perceptions of their willingness or disposition to initiate self-regulatory strategies. The present study implemented a 24-item scale that assesses college students' perceptions of their self-regulatory capabilities and their perceptions of the frequency with which they initiate key self-regulatory strategies.

The conceptual framework for the 24-item SESRL is 13 categories of self-regulated learning derived from social learning theory and research validated by Zimmerman and Martinez-Pons (1986). In the validation study, examples of the categories, drawn from structured interviews, differentiated between high school students in the high achievement and other tracks. In a later study, Zimmerman et. al. (1992) used 11 general items derived from 6 categories to assess students' beliefs about how well they execute self-regulatory strategies. The stem "How well can you..." introduced the items and response choices ranged from 1 (not well at all) to 7 (very well). Examples of items include "arrange a place to study without distractions" and "organize your class work."

In the present study, the researchers implemented the 11 items developed by Zimmerman et. al. (1992) and 13 additional items that assessed students' perceptions of their use of self-regulatory strategies. Five of the additional 13 items were examples cited by students in the Zimmerman and Martinez-Pons (1986) study. Examples are "I check over my work to be sure I did it right" and "When preparing for a test, I review my notes." The five items reflect, respectively, the categories of self-evaluation, seeking social assistance, reviewing records, and environmental restructuring. The present researchers developed eight items for the categories of seeking social assistance, keeping records (2 items), organizing and transforming (2 items), and rehearsing and memorizing. Examples are "I write things down I want to remember" (keeping records) and "Before beginning a project I get as much information as possible about the topic" (organizing and transforming). Because a "how well" judgment is not meaningful for most of these activities, subjects were asked to indicate how often they implement each activity. Response options ranged from 1 (not at all) to 7 (very often). Cronbach's alpha was .90 for the pretest and .89 for the posttest administration of the SESRL. In addition, the correlation between items 1 to 11 and items 12 to 24 was .72 for the 235 students who served as the sample for the factor analysis of the scale (Gredler & Schwartz, 1997).

A sample of 260 undergraduate students in education and health science completed the scale for the purpose of conducting an exploratory factor analysis of the SESRL. Incomplete data for 25 students resulted in a final sample of 235 subjects. The principal factor method was used to extract the factors, followed by a promax (oblique) rotation. A five-factor model accounted for 98% of the common variance following the initial extraction of factors. The five factors were general organization and planning strategies (7 items), task preparation strategies (5 items), environmental restructuring (3 items), recall ability (2 items) and typical study strategies (2 items). Coefficient alphas

for the five factors were .84, .72, .79, .70, and .63, respectively. In this model, 19 of the 24 items loaded on one of the five factors with a standardized regression coefficient of at least .40.

Goal-analysis skill and goal-setting habits. The goal-analysis measure consisted of 10 statements that students were asked to evaluate as to type of goal (long-term, strategy sub-goal, neither); problems in the statement (too vague, too distant, unchallenging, unattainable, no problems); and focus (mastery or performance). Maximum possible score on the instrument was 80; KR-20 for the 10-item measure was .46.

The assessment of goal-setting habits consisted of 15 statements adapted from Locke and Latham (1990) and other sources. Examples are "I set high standards for myself for activities that are important to me" and "I do not have clear, specific goals for this semester." Response choices ranged from 1 (not typical of me) to 10 (very typical of me). Cronbach's alpha coefficient for the measure was .70 for the pretest and .73 for the posttest administration.

Results

Pearson product-moment coefficients between pre-and posttest scores, within-group regression coefficients, and tests for homogeneity of regression indicated that the assumptions for analysis of covariance were met for goal-setting habits and SESRL, using the pretest scores as a covariate. An alpha level of .05 was used for all statistical tests. The analysis indicated no significant differences for goal-setting habits, F (1,73) = 3.69, p = .0587. The adjusted group means were 106.88 (treatment group, N = 37) and 112.91 (control group, N = 38). The standard deviation for the treatment group increased from 12.45 on the pretest to 19.13 on the posttest. In contrast, the standard deviation for the control group decreased from 15.06 (pretest) to 13.33 (posttest). Further analysis revealed an extreme outlier (decrease of 94 points on the posttest) in the treatment group. The ANCOVA was re-computed without the outlier indicating, once again, no significant difference, F (1, 72) = 1.11, p = .2954.

The ANCOVA indicated a significant difference for SESRL, F (1, 73) = 4.47, p = .0379. The adjusted group means were 126.1 (treatment group) and 130.3 (control group). The standard deviations for the treatment group were 14.01 (pretest) and 15.40 (posttest) and 18.05 (pretest) and 16.27 (posttest) for the control group. ANCOVA on the SESRL eliminating the five items that did not load on any factor was non-significant. SESRL was further analyzed by comparing the group means on the five factors identified by the exploratory factor analysis of the SESRL (Gredler & Schwartz, 1997). The results of the ANCOVA for each factor are reported in Table 1. A significant difference was indicated for Factor 2 (task preparation strategies), F (1, 73) = 6.00, p = .0168. The treatment condition rated themselves as less self-efficacious for task preparation strategies (M = 22.84, SD = .41) than the control condition (M= 24.24, SD = .40).

A one-tailed t-test on the group means for goal analysis indicated a significant difference, t (73) = 5.19, p < .0001. The group means were 48.59 (treatment group) and 39.82 (control group). The standard deviations were 7.19 and 7.42, respectively.

Discussion

The study indicates that goal-setting instruction is efficient and effective in teaching basic concepts about the nature and purposes of goals, the types of goals, and the qualities of effective goals. As indicated in the prior section, the treatment group outperformed the control group on the goal-analysis posttest.

The instruction did not significantly impact goal-setting habits. A possible explanation for the lack of significance is that students were asked to rate the *typicality* of behaviors, in effect, setting the intervention period in contrast to prior life history. Brief instructional treatments over a four-week period would not likely influence judgments of habits developed over many years. Further, upper-class students in health science are accomplishing the first phase of their chosen career. Thus, they may see no need to alter their personal approach to long or short-term planning. In addition, students may have failed to transfer the concepts from the specific, concrete examples in the instruction to the less concrete situations in the instrument. The instrument included items such as, "I achieve my goals without much effort" and "Once I make up my mind to achieve something, nothing can stop me." To significantly affect such general, abstract activities may require a longer intervention period with a greater depth of coverage.

The group receiving goal-setting instruction scored significantly lower than the control group on SESRL. A comparison of factor-based scores indicated only a significant difference for task preparation strategies. Further research is needed to determine if some students re-examined their perceptions of their self-regulatory strategies as a result of the instruction. Pajares (1996) and others suggest that most students overestimate their academic capabilities. The goal-setting instruction may have led students to reflect on their self-regulatory strategies, thus serving to calibrate the accuracy of their self-perceptions. Further research should assess students' knowledge of appropriate self-regulatory strategies pre and post-intervention to examine this possibility.

In prior studies, self-efficacy has increased significantly after a self-regulatory intervention (e.g., Bandura & Schunk, 1981; Schunk, 1983b). The present researchers hypothesize that the nature of the self-efficacy measure may account for the contrast in findings. That is, it asks students about particular strategies, such as finishing homework by deadlines and organizing your class work without reference to particular courses. Students may implement strategies well for some of their courses and not others, but perceive they are implementing them consistently. Prior studies have measured self-efficacy microanalytically as the belief in one's ability to master highly specified tasks (e.g., subtraction problems). Thus, self-efficacy effects may vary substantially for different types of tasks. Future research should examine the relationship between type of task and self-efficacy as well as the value of more generalizable measures of self-efficacy.

Table 1

Analysis of covariance for SESRL factors

Factor	F	p
1 - General organizing/planning (Examples: How well can you...finish assignments by deadlines, concentrate on school subjects, organize your class work)	0.13	.7221
2 - Task preparation strategies (Examples: I plan what I am going to do before I begin a class project; When preparing for a test, I reread my textbook)	6.00	.0168
3 - Environmental restructuring (Examples: I turn off the TV/radio so I can concentrate on what I am doing; I isolate myself from anything that disturbs me)	0.01	.9264
4 - Recall ability (Examples: How well can you...remember information presented in class, remember information presented in textbooks)	0.52	.4712
5 - Typical ~~study~~ learning strategies (Examples: How well can you take class notes; When preparing for a test, I reread my class notes)	2.02	.1591

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